

## HAT2077R

Silicon N Channel MOS FET  
High Speed Power Switching

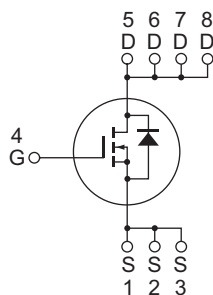
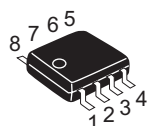
REJ03G1179-0200  
(Previous: ADE-208-1228)  
Rev.2.00  
Sep 07, 2005

### Features

- Low on-resistance
- Low drive current
- High density mounting

### Outline

RENESAS Package code: PRSP0008DD-D  
(Package name: SOP-8 <FP-8DAV> )



1, 2, 3 Source  
4 Gate  
5, 6, 7, 8 Drain

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	200	V
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	3	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	24	A
Body-drain diode reverse drain current	I <sub>DR</sub>	3	A
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	2.5	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

www.DataSheet4U.com 2. When using the glass epoxy board (FR4 40 × 40 × 1.6 mm), PW ≤ 10 s

## Electrical Characteristics

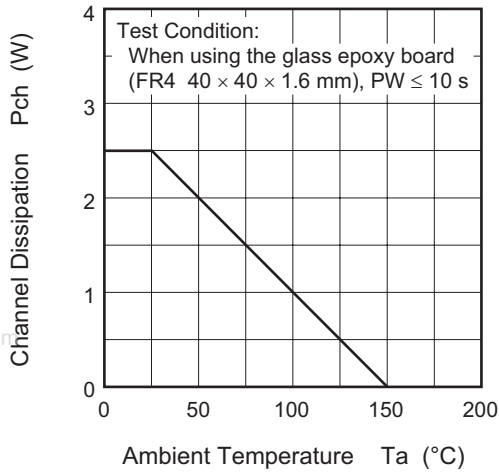
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	200	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±0.1	μA	V <sub>GS</sub> = ±30 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 200 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	3.0	—	4.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	0.18	0.235	Ω	I <sub>D</sub> = 1.5 A, V <sub>GS</sub> = 10 V <sup>Note 3</sup>
Forward transfer admittance	y <sub>fs</sub>	2.3	3.8	—	S	I <sub>D</sub> = 1.5 A, V <sub>DS</sub> = 10 V <sup>Note 3</sup>
Input capacitance	C <sub>iss</sub>	—	830	—	pF	V <sub>DS</sub> = 25 V
Output capacitance	C <sub>oss</sub>	—	115	—	pF	V <sub>GS</sub> = 0
Reverse transfer capacitance	C <sub>rss</sub>	—	23	—	pF	f = 1 MHz
Turn-on delay time	t <sub>d (on)</sub>	—	23	—	ns	V <sub>DD</sub> ≅ 100 V, I <sub>D</sub> = 1.5 A
Rise time	t <sub>r</sub>	—	10	—	ns	V <sub>GS</sub> = 10 V
Turn-off delay time	t <sub>d (off)</sub>	—	70	—	ns	R <sub>L</sub> = 66.7 Ω
Fall time	t <sub>f</sub>	—	10	—	ns	R <sub>g</sub> = 10 Ω
Total gate charge	Q <sub>g</sub>	—	23	—	nC	V <sub>DD</sub> = 160 V
Gate to source charge	Q <sub>gs</sub>	—	3.5	—	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Q <sub>gd</sub>	—	10	—	nC	I <sub>D</sub> = 3 A
Body-drain diode forward voltage	V <sub>DF</sub>	—	0.75	1.15	V	I <sub>F</sub> = 3 A, V <sub>GS</sub> = 0 <sup>Note 3</sup>
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	75	—	ns	I <sub>F</sub> = 3 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 100 A/μs

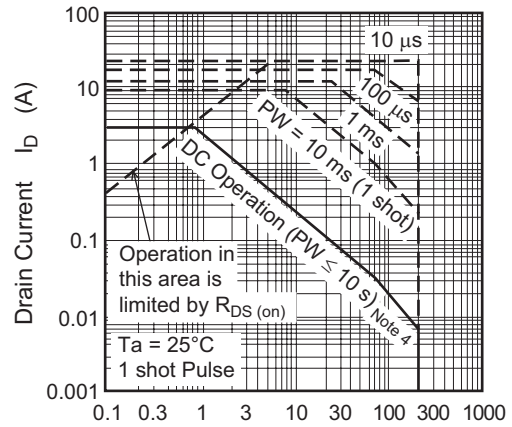
Note: 3. Pulse test

Main Characteristics

Power vs. Temperature Derating



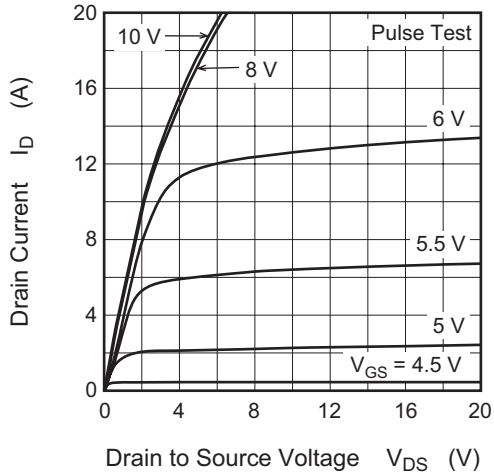
Maximum Safe Operation Area



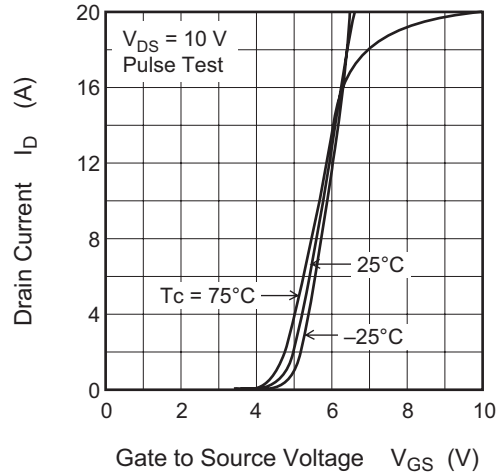
Drain to Source Voltage  $V_{DS}$  (V)

Note 4:  
When using the glass epoxy board (FR4 40 × 40 × 1.6 mm)

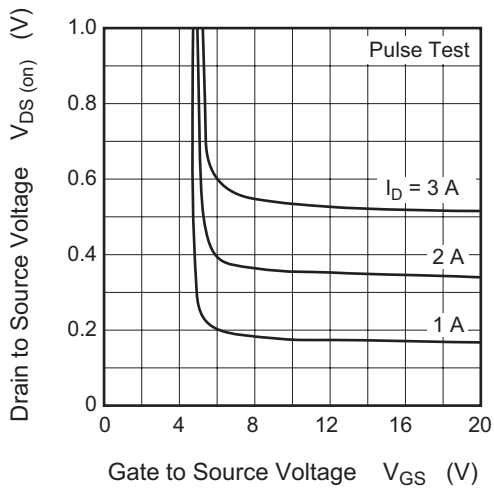
Typical Output Characteristics



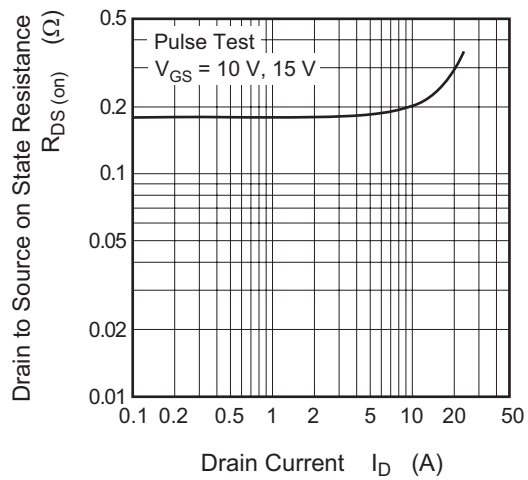
Typical Transfer Characteristics

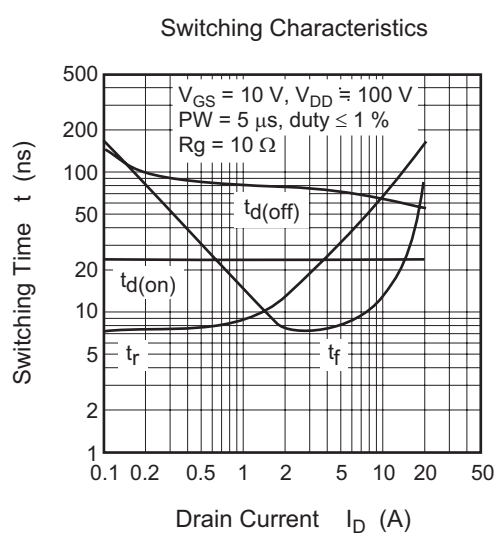
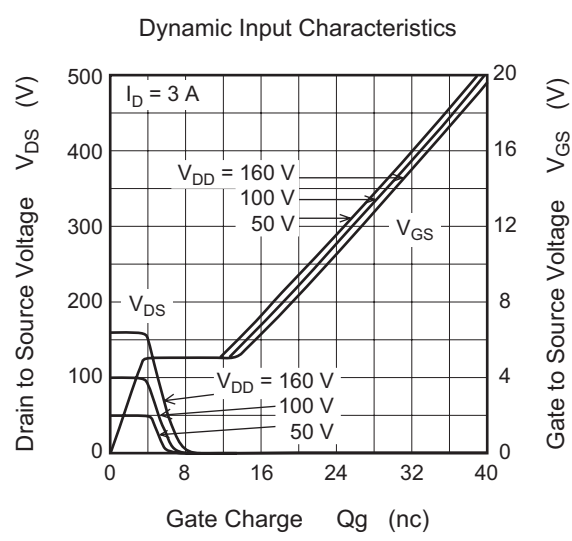
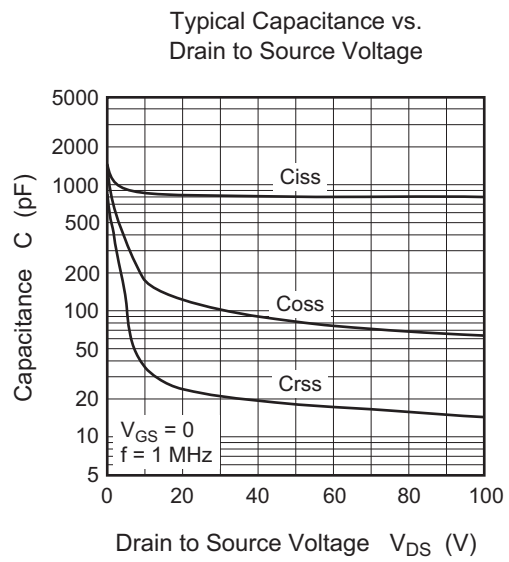
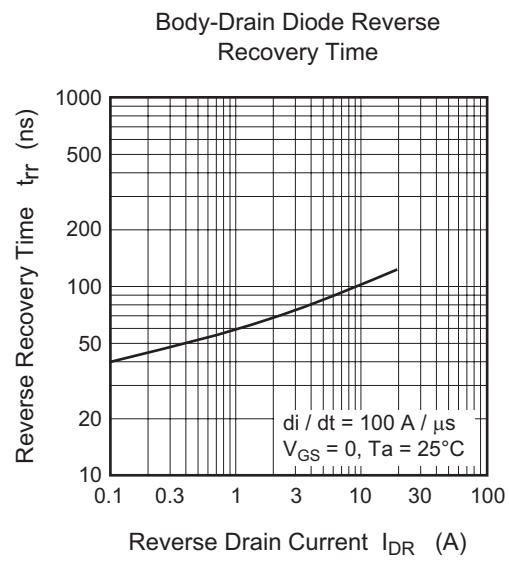
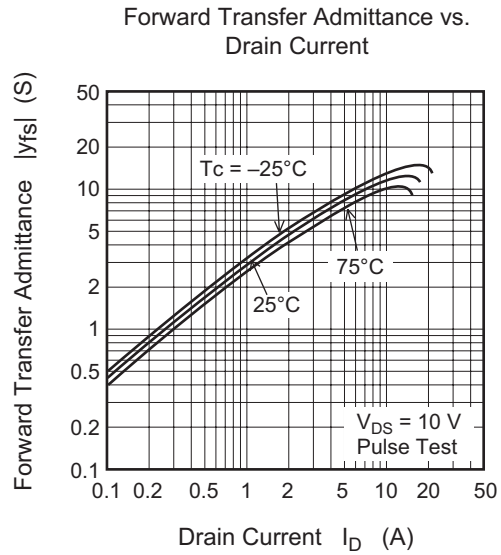
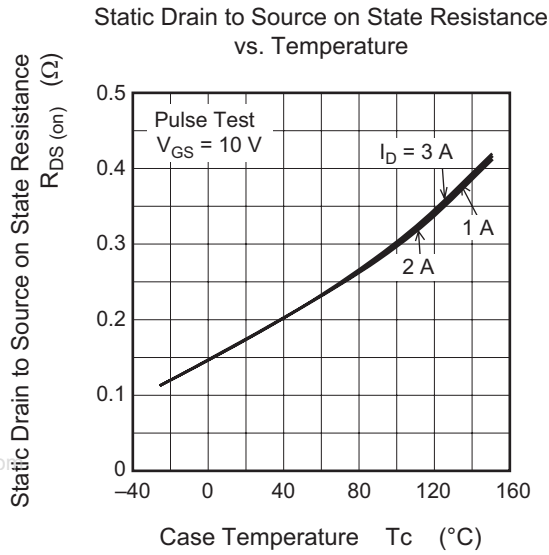


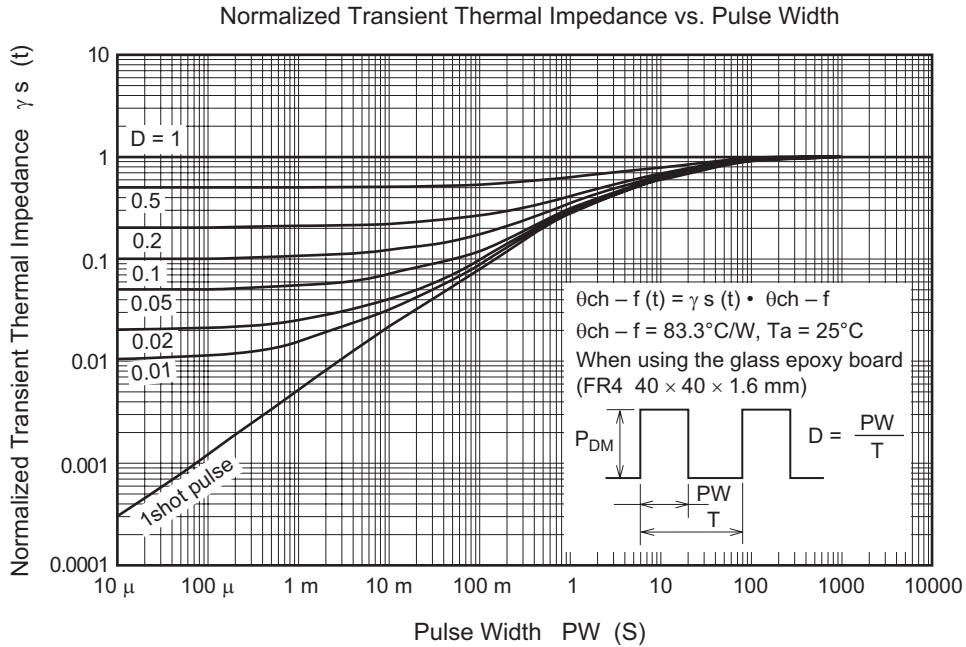
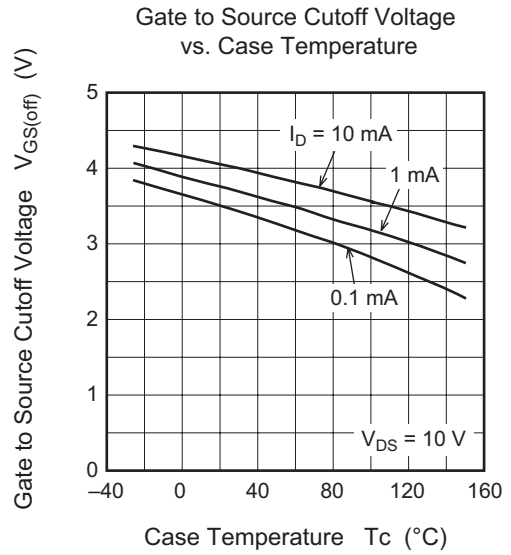
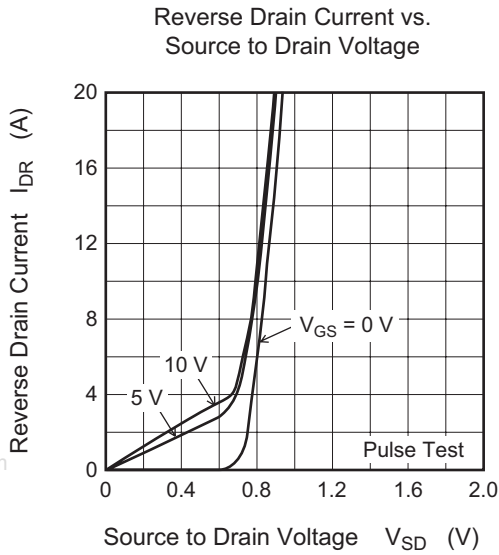
Drain to Source Saturation Voltage vs. Gate to Source Voltage



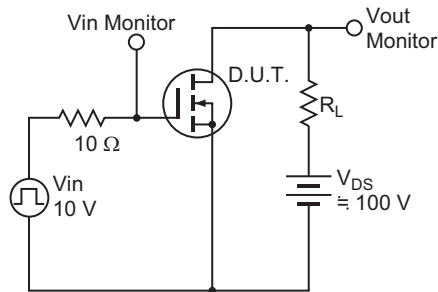
Static Drain to Source on State Resistance vs. Drain Current



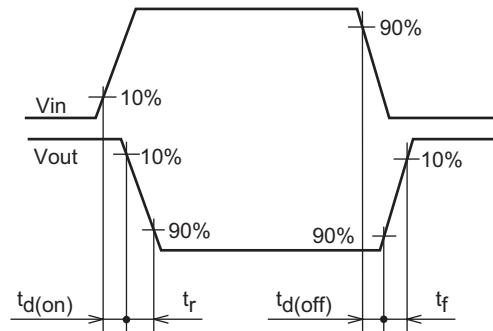




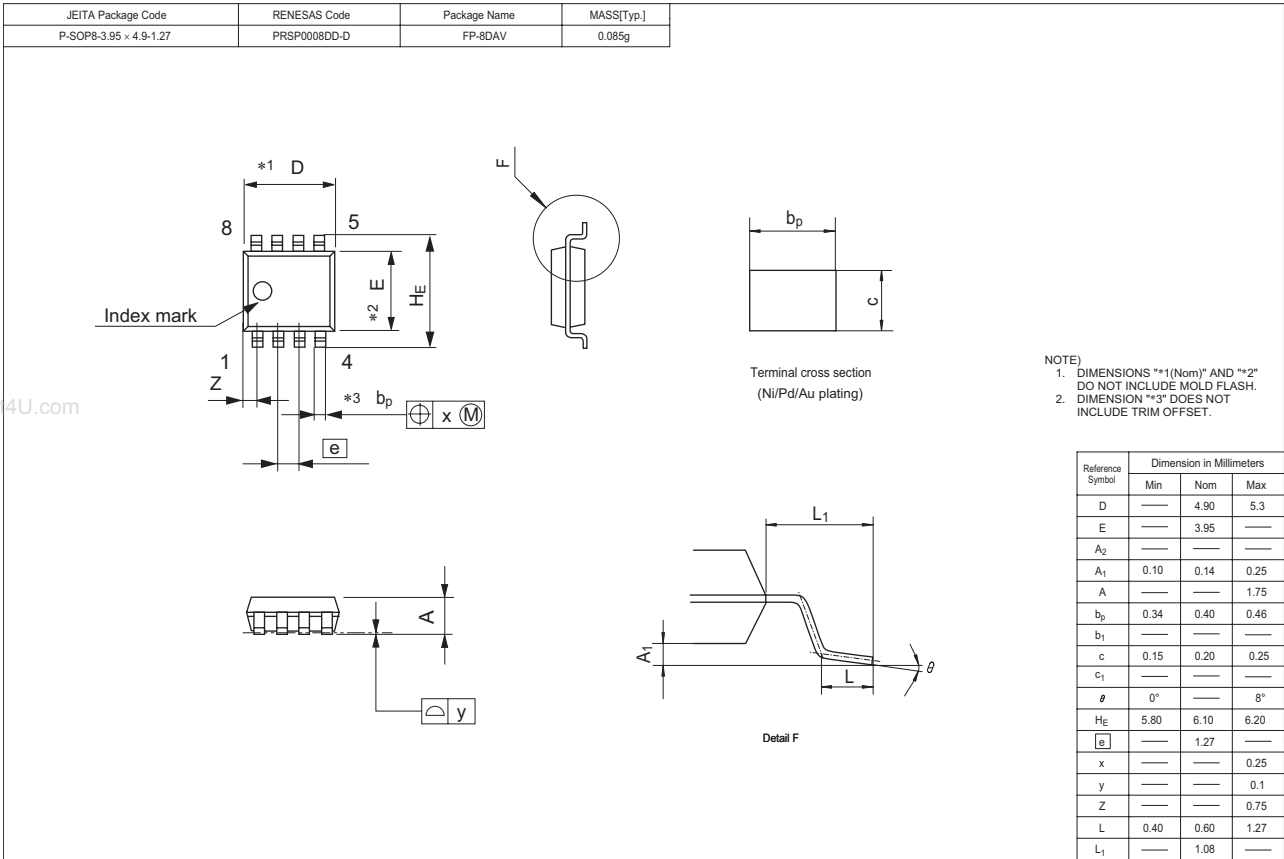
Switching Time Test Circuit



Switching Time Waveform



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT2077R-EL-E	2500 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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